CATHODE-RAY TUBE

The TELEFUNKEN Type 3 BVP is a three inch flat face, single beam, electrostatic deflection and focus Cathode-Ray-Tube, with very high deflection sensitivity, small spot size and half heater power, thereby the tube is particularly suitable for transistorized oscilloscopes.

<table>
<thead>
<tr>
<th>3 BVP 2</th>
<th>3 BVP 7</th>
<th>3 BVP 11</th>
<th>3 BVP 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN 7-18</td>
<td>DP 7-18</td>
<td>DB 7-18</td>
<td>DG 7-18</td>
</tr>
</tbody>
</table>

Tentative

Focusing Method: Electrostatic
Deflecting Method: Electrostatic

Direct Inter-electrode Capacitances, Approximate

- Cathode to all other electrodes: 4.0 μμf
- Grid 1 to all other electrodes: 7.3 μμf
- D1 to D2: 2.8 μμf
- D3 to D4: 2.0 μμf
- D1 to all other electrodes except D2: 3.3 μμf
- D2 to all other electrodes except D1: 3.0 μμf
- D3 to all other electrodes except D4: 3.5 μμf
- D4 to all other electrodes except D3: 3.6 μμf
- Grid 1 to D1, D2, D3, D4: 0.6 μμf
- Cathode to D1, D2, D3, D4: 0.1 μμf
- D1, D2 to D3, D4: 0.8 μμf

OPTICAL DATA

Phosphor Number
- P 2
- P 7
- P 11
- P 31

Fluorescent Color
- Bluegreen
- Blue
- Yellowgreen

Phosphorescent Color
- Green
- Long

Persistence
- Short

MECHANICAL DATA

Overall Length: 12 Max Inches
Greatest Diameter of Bulb: 3 ± 1/16 Inches
Minimum Useful Screen Diameter: 2 43/64 Inches
Base Small-Button Unidekar 11 pin: E 11-22
Basing: 11 X
Base Alignment
- D3 D4 trace aligns with pin No. 11 and tube axis: 45 ± 10 Degrees
- Positive voltage on D2 deflects beam approximately toward the midpoint between pin 3 and 4
- Positive voltage on D3 deflects beam approximately toward the midpoint between pin 6 and 7

from JEDEC release #3492, Nov. 20, 1961
MECHANICAL DATA (Continuation)

Angle between D3 D4 and D1 D2 traces 90 ± 1 Degrees
Bulb contact alignment:
J 1-22 and J 1-25 contact aligns with trace of D1-D2 (between pin 9 and 10) ±10 Degrees

RATINGS (Absolute maxima) Note 1

Heater Voltage 6.3 Volts
Heater Current at 6.3 volts 0.3 ± 10% Ampere
Post-Accelerator voltage 8,000 Max Volts DC
Isolation Shield voltage 2,300 Max Volts DC
Accelerator voltage 2,300 Max Volts DC
Grid 2 voltage 2,300 Max Volts DC
Grid 3 voltage (Focusing Electrode) 2,300 Max Volts DC
Grid 1 Voltage
   Negative-Bias Value -250 Max Volts DC
   Positive-Bias Value 0 Max Volts DC
   Positive-Peak Value 0 Max Volts DC
Peak-Heater-Cathode Voltage
   Heater negative with respect to cathode 180 Max Volts
   During warm-up period not to exceed 15 seconds 180 Max Volts
   After equipment warm-up period 180 Max Volts
   Heater positive with respect to cathode 180 Max Volts
Peak Voltage between Accelerator and any Deflection Electrode 800 Max Volts
The product of Grid 2 voltage and cathode current 0.25 Max Watts

MAXIMUM CIRCUIT VALUES

Grid 1 Circuit Resistance 5.5 Max Megohms
Resistance for Deflecting-Electrode Circuit D1, D2 (Note 10) 110,000 Max Ohms
Resistance for Deflecting-Electrode Circuit D3, D4 (Note 10) 55,000 Max Ohms
TYPICAL OPERATING CONDITIONS (Note 1)

Post-Accelerator voltage 1,600 Volts
Isolation Shield voltage 430 Volts
Grid 2 voltage 1,600 Volts
Grid 3 voltage (Focusing Electrode) 135 to 162 Volts
Accelerator voltage (Note 2) 400 to 430 Volts
Modulation (Note 3) 33 Max Volts
Grid 1 voltage (Note 4) -67 to -87 Volts

Deflection Factors:

D 1 and D 2 27,2 to 33,8 Volts DC per inch
D 3 and D 4 8,1 to 10,7 Volts DC per inch

Focusing Electrode Current for any operating condition
-20 to +20 Microamperes

Spot Position ( undeflected) (Note 5) 3.5 Max Millimeters
Line Width (Note 6) 0.022 Max Inches
Deflection factor uniformity (Note 7) 2 % max.
Pattern distortion (Note 8) 1.5 % max.

For Anode Voltage not shown in the preceding table,
the following can be used as a guide:

Focusing Electrode Voltage 33.8 % to 40.5 % of Anode Volts
Grid 1 Voltage (Note 4) 16.8 % to 21.8 % of Anode Volts

Deflection Factors:

D 1 and D 2 68 to 84,5 Volts DC per inch per Kilovolt of Anode
D 3 and D 4 20,2 to 26,8 Volts DC per inch per Kilovolt of Anode
Useful scan D 1-D 2 (Note 9) 60 Min Millimeters
Useful scan D 3-D 4 (Note 9) 60 Min Millimeters
Post Accelerator helix resistance 47 to 234 Megohms

Pin Connection

Pin No. 1 Heater  Pin No. 7 D 1
Pin No. 2 Heater  Pin No. 8 Accelerator
Pin No. 3 Grid No. 1  Pin No. 9 D 3
Pin No. 4 Cathode  Pin No. 10 D 4
Pin No. 5 Focusing Electrode Grid No. 3  Pin No. 11 Grid No. 2
Pin No. 6 D 2
1. All voltages taken with respect to cathode.

2. The accelerator voltage is made variable from 400 Volts to 430 Volts to provide for
estigmatism control. In order to maintain proper astigmatism adjustment as total
cathode current is varied, it is recommended that the resistance in the accelerator
circuit is small. (The midpotential of the deflection electrodes is 400 V.)

3. The increase in Grid No. 1 voltage from cutoff to produce a screen current
of 10 μA DC.

4. Visual extinction of undeflected focused spot.

5. Connect free deflecting electrodes to anode.

6. For a beam current of 10 microamperes DC in accordance with Mil-E-1 C specification.

7. The deflection factor (for both D 1 D 2 and D 3 D 4 plate pairs, separately) for de-
flections of less than 75% of the useful scan will not differ from the deflection factor
for a deflection of 25% of the useful scan by more than specified amount.

8. The edges of a raster pattern with the mean dimension 45 × 45 mm will not deviate
from the mean dimension by more than the specified amount.

9. If use is made of the full deflection capabilities of the tube, the deflection plates will
intercept part of the electron beam near the edge of scan, hence a low impedance
deflection plate drive is desirable.

10. It is recommended that the deflecting-electrode-circuit resistance
be approximately equal.

Accessories:

<table>
<thead>
<tr>
<th>Item</th>
<th>Stock No.</th>
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<tbody>
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<td>Shielding</td>
<td>30477</td>
</tr>
<tr>
<td>Socket</td>
<td>30232</td>
</tr>
<tr>
<td>Post-acceleration cap</td>
<td>30317</td>
</tr>
<tr>
<td>Cap for g3 terminal</td>
<td>30341</td>
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</tbody>
</table>
The J1-22 contact aligns with trace of D1 - D2 maximal deviation ±10 degrees

J1-25 neck contact aligns with trace of D1 - D2 maximal deviation ±10 degrees

The tube must not be mechanically stressed when attaching or removing the socket.

Circuit elements may not be supported on free pins or socket contacts.